



INFORMATION TECHNOLOGY

GOREX: Guam Open Research & Education eXchange

Rommel Hidalgo, Chief Information Officer

University of Guam

Joint Engineering Team (JET) Updates @ Internet2 Global Summit

May 9th, 2018



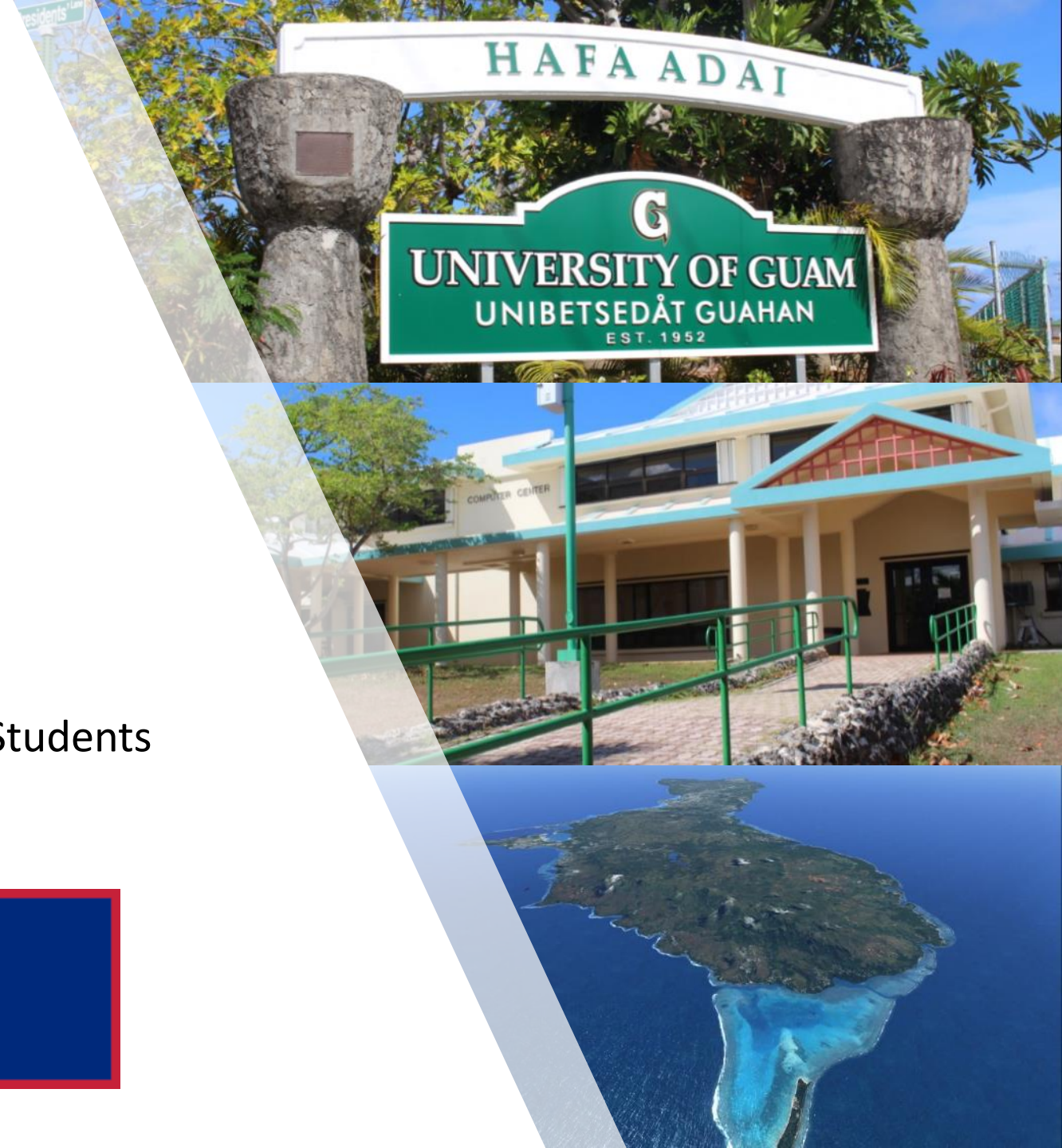
Educate. Innovate. Connect.



Background on Guam

U.S. Territory of Guam

- **Hafa Adai** : Hello, how are you?
- Population: ~ 172,365
- United States Territory since **1898**
- University of Guam (est. 1952): ~ 4,000 Students



Guam's Economy

- **GDP: ~ \$5.8 Billion (2016)**
- **Tourism and U.S. National Defense spending**
- **Over 1.5 Million Visitors in 2016 (\$1.4 Billion)**



Guam's Economy

- **GDP: ~ \$5.7 Billion**
- Over 1.5 Million Visitors in 2016 (~\$1.4 Billion)
- Tourism and **U.S. National Defense spending (~\$2 Bil.)**
- U.S. Navy, Air Force, Army National Guard
- ~ 5,000 Marines will relocate to Guam from Okinawa





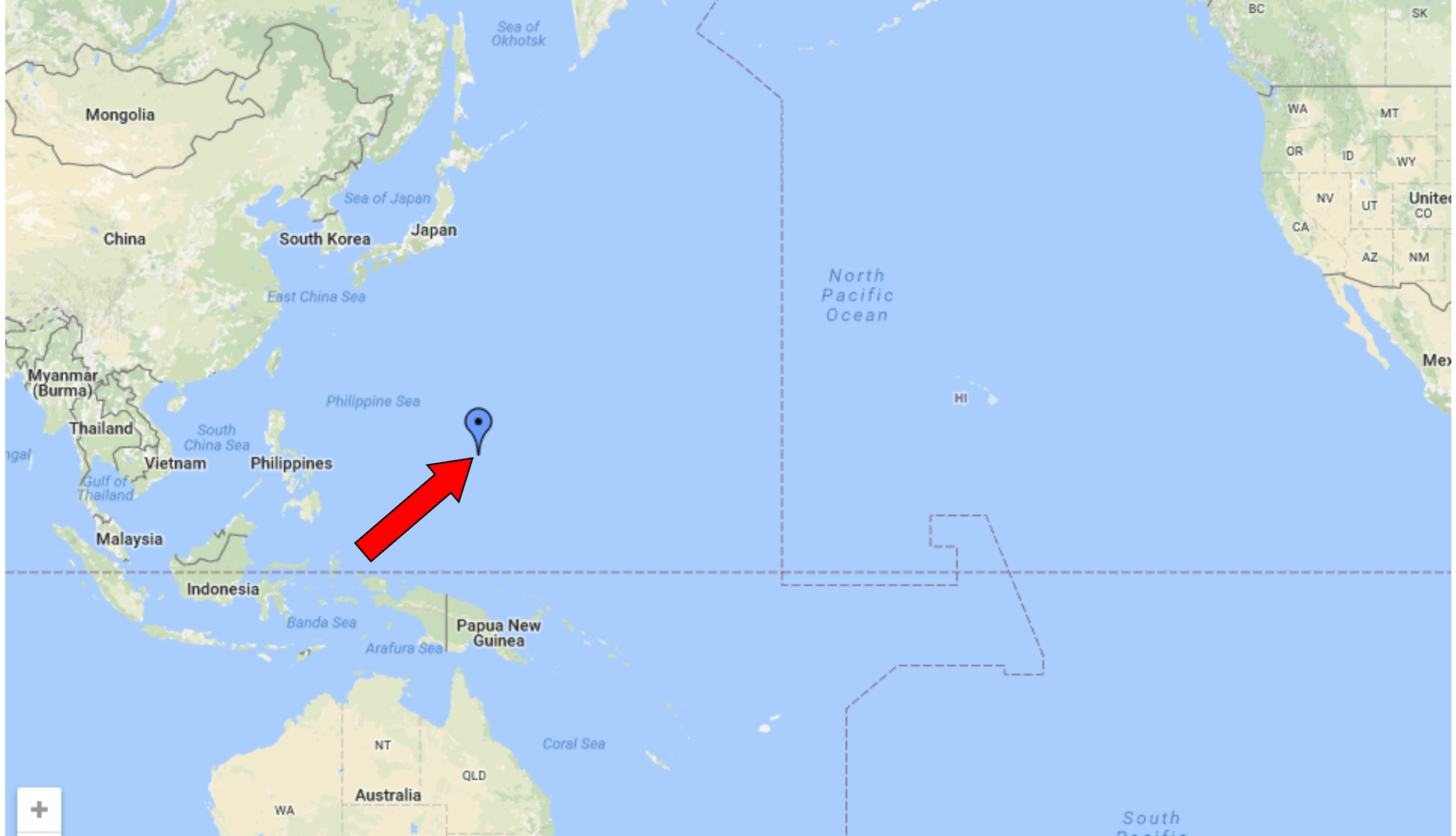
Military Presence on Guam



Guam

Department of Defense land

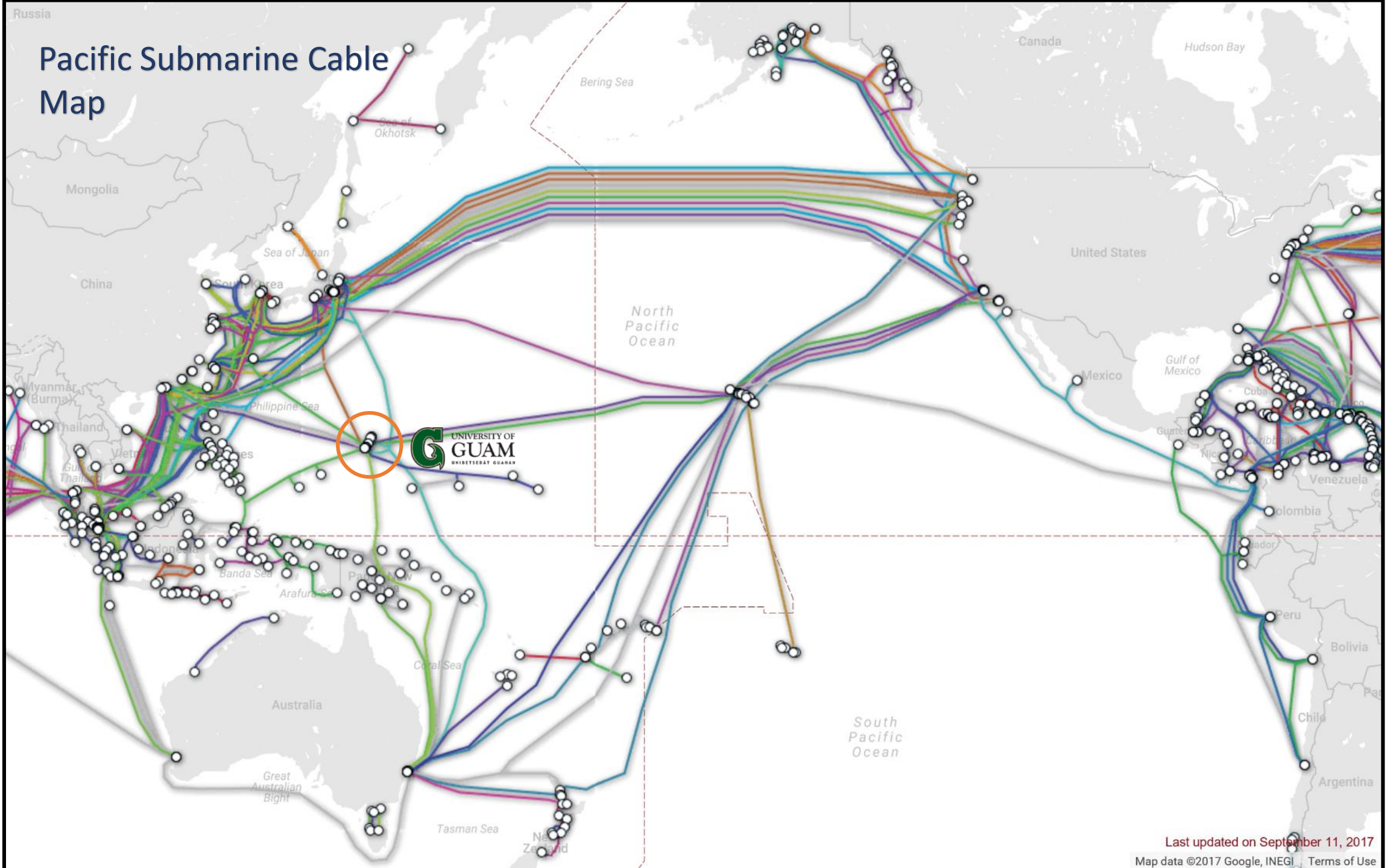




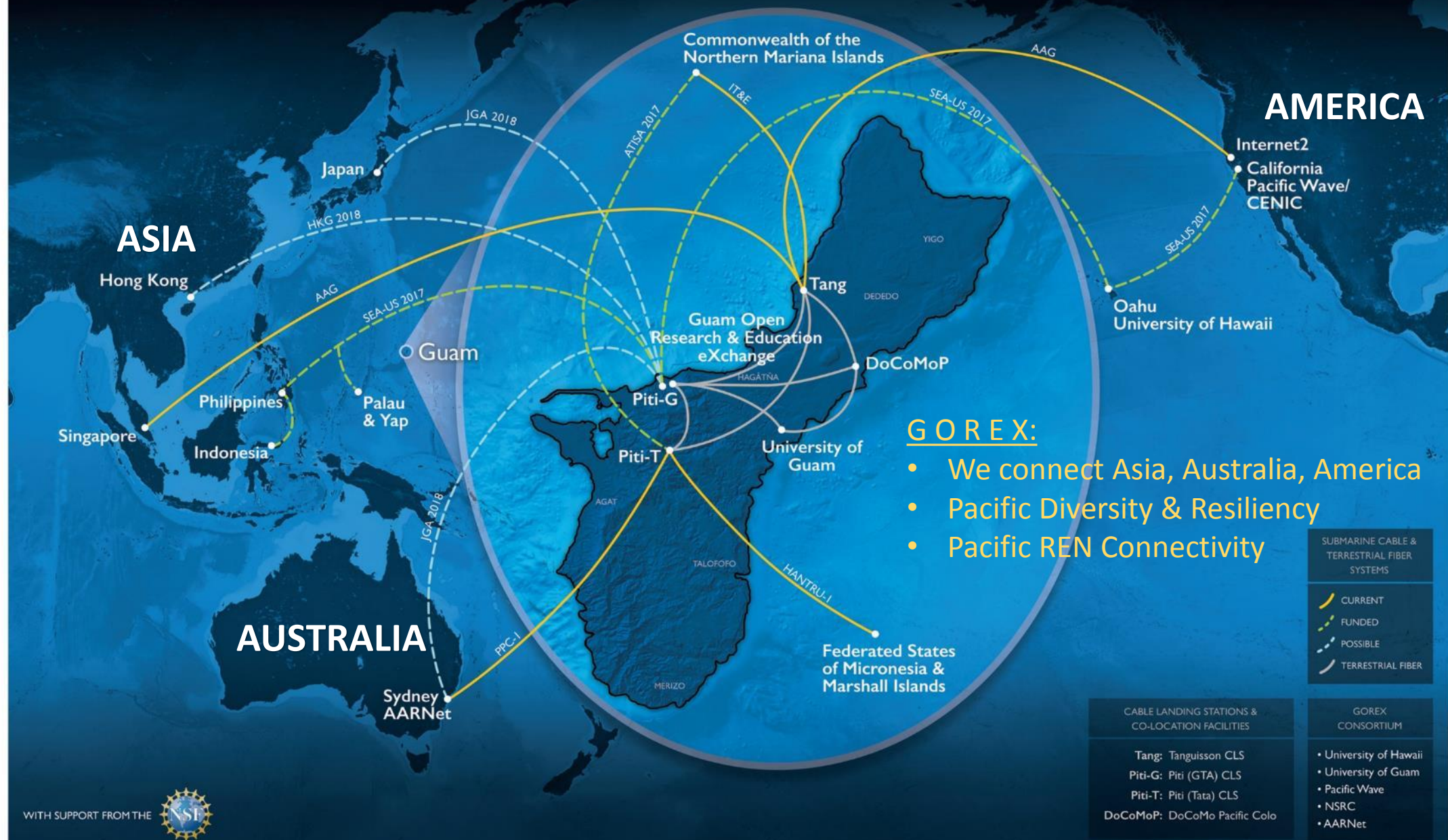


Strategic Connectivity Waypoint

Pacific Submarine Cable Map



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UNIVERSITY of HAWAI'I®

NSRC
Network Startup Resource Center

PACIFIC WAVE

Internet2
California
Pacific Wave/
CENIC
CENIC
Connecting California

G UNIVERSITY OF GUAM
UNIBETSEDAT GUAHAN

aarnet
Australia's Academic
and Research Network

INTERNET²
MEMBER



**International
Networks**
at Indiana University

REANNZ

PIREN: Pacific Islands R&E Network Plans and Opportunities





SPEEDS/POPS

1 - 2.5 Gbps

10 Gbps

100 Gbps

CURRENT FUTURE

- Pacific Wave POPs
- Pacific Research Platform (PRP)
- PRP Science DMZ Fabric
- Software Defined Network
- Commercial Peering Points (Amazon, Google, & Microsoft)

WESTERN REGIONAL NETWORK

States served by WRN members:

- ABQG: New Mexico GigaPoP
- CENIC: California
- FRGP: Colorado and Wyoming
- PNWGP: Washington, Montana, Alaska, Oregon & Idaho
- UH: Hawaii





INTERNET2 NETWORK INFRASTRUCTURE TOPOLOGY

APRIL 2016




IN SUPPORT OF
U.S. UCAN

NETWORK PARTNERS








GOREX Status

❑ **PIREN: GOREX**

- Juniper MX-480 installed at GTA Upper Tumon Co-Lo Facility in Guam (**1.8.18**)
- SEA-US (100-Gbps) is Connected to GOREX – the first of multiple circuits.

❑ **GOREX Local Hands – Training & Professional Development**

- We will continue to work with our **NSF CC*** Grant (OAC-1659182) **leadership institutes**, the NSRC and the University of Hawai'i, to continue to improve our technical capabilities to support and develop GOREX.
- We will continue to participate in Co-Training opportunities with the NSRC:

❑ **Guam continues to Engage with the Global REN Community**

GOREX Live - Jan 8, 2018

- Juniper MX480
- Cisco 2911 Terminal Server
- SuperMicro PerfSonar @ 40Gbps
- BeagleBone Delay Node





GOREX Installation – Jan. 2018



Planned move

- GTA building new colo space on basketball court
- Adjacent to new Piti CLS
- GOREX will move from Tumon CO to Piti Colo 2019?
- Any circuits coming in should take this into account

GTA Piti CLS



Growth

- MPC7-MRATE - up to 4 x 100G & 8 x 40G
- Add another MPC7-MRATE or other card later as requirements increase
- 4 more open MX480 slots
- Available power and space for additional equipment



GOREX Press
Conference – Jan. 2018



GOREX Press
Conference –
University of Hawai'i &
University of Guam

2018-01-18 09:03:28

Si Yu'os Ma'ase
(Thank You)
to UH and NSRC!





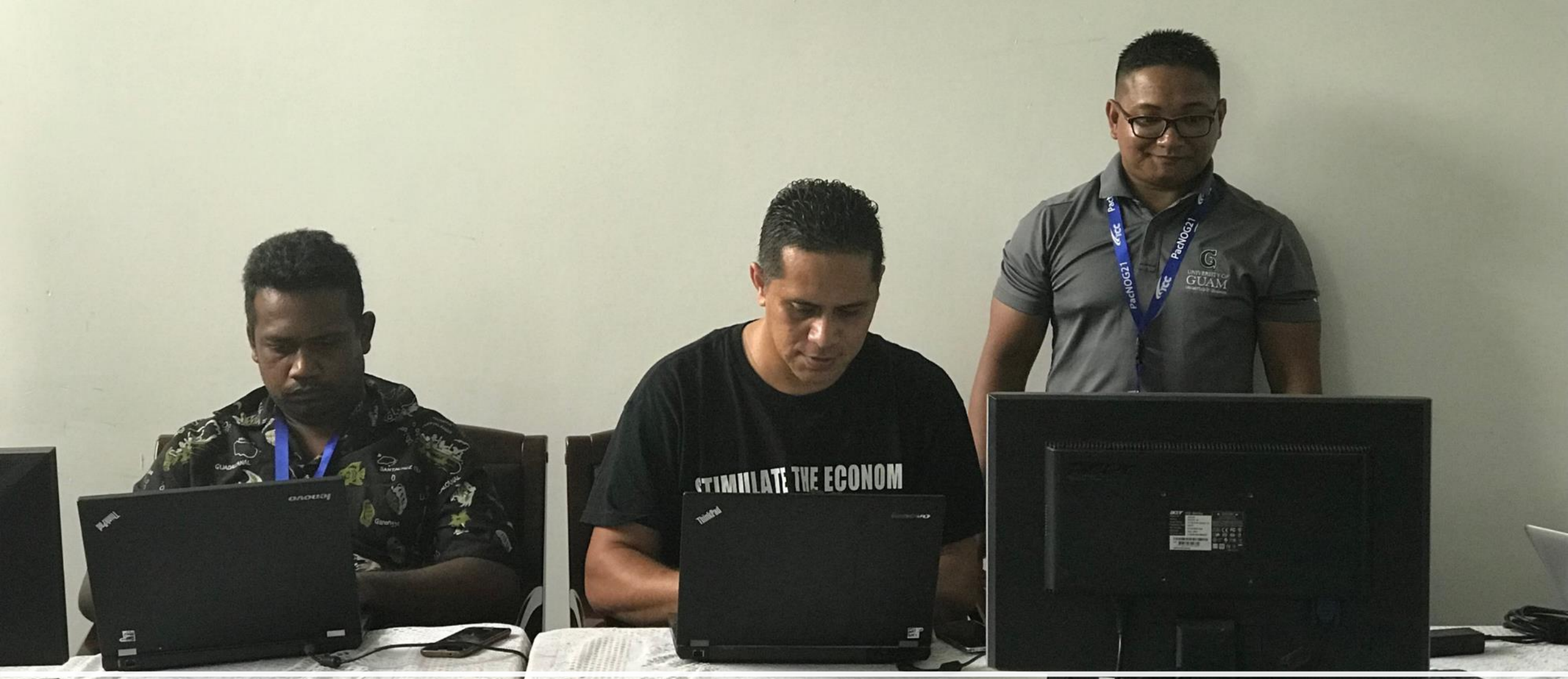
**CyberTeam – GOREX Local Hands
Engaging with the REN Community**







May 2017 NSRC and CENIC DEA @ UOG



PacNOG Dec. 2017, Tonga, Joint-Training with NSRC

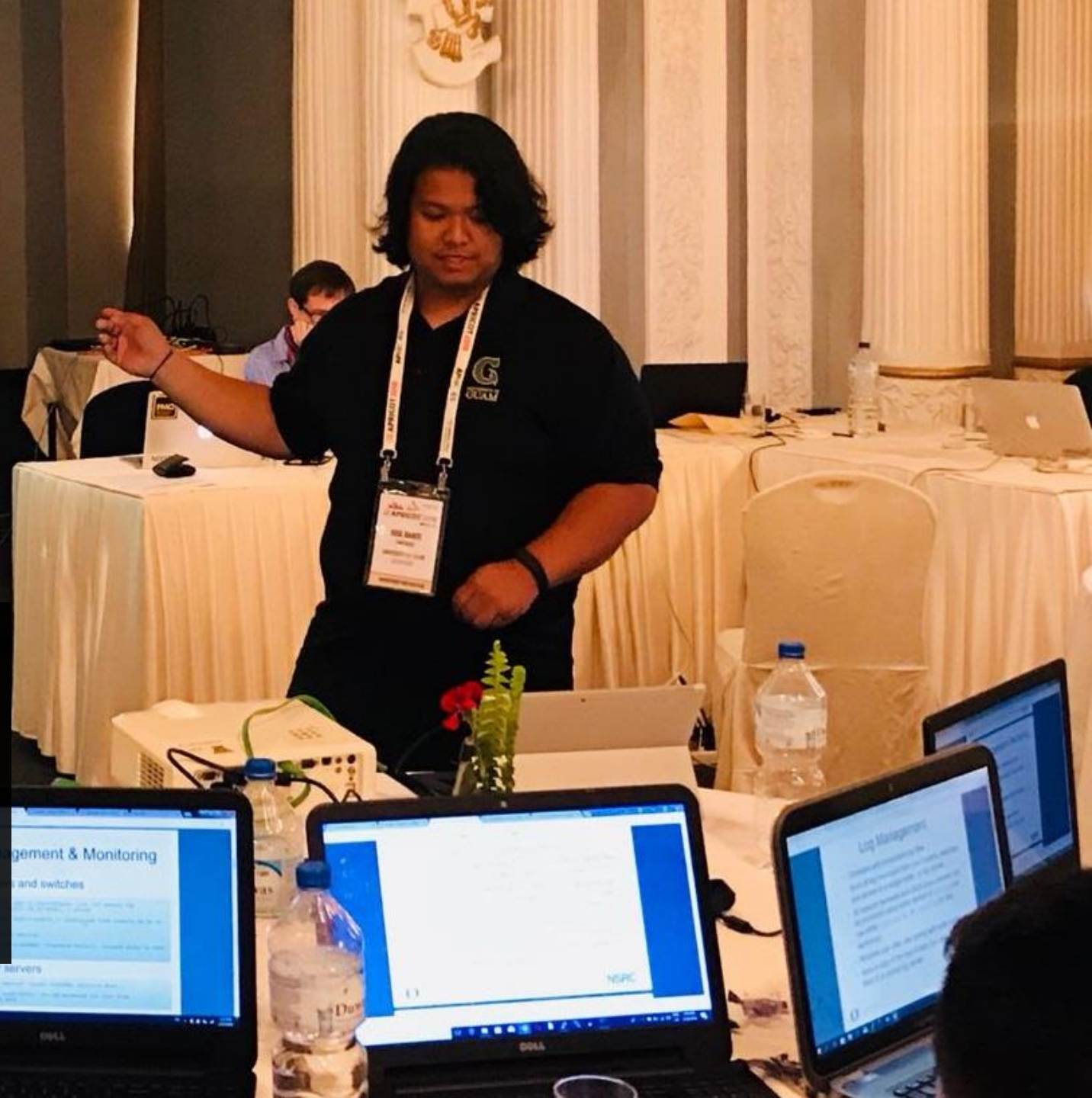


PacNOG Dec. 2017, Tonga, Joint-Training with NSRC

- Windows can, also, use syslog with extra tools.
- Save a copy of the logs locally, but, also, save them to a central log server.

NSRC

APRICOT 2018, Nepal, Joint-Training with NSRC





APRICOT 2018, Nepal, Joint-
Training with NSRC

APRICOT 2018, Nepal, Joint-Training with NSRC



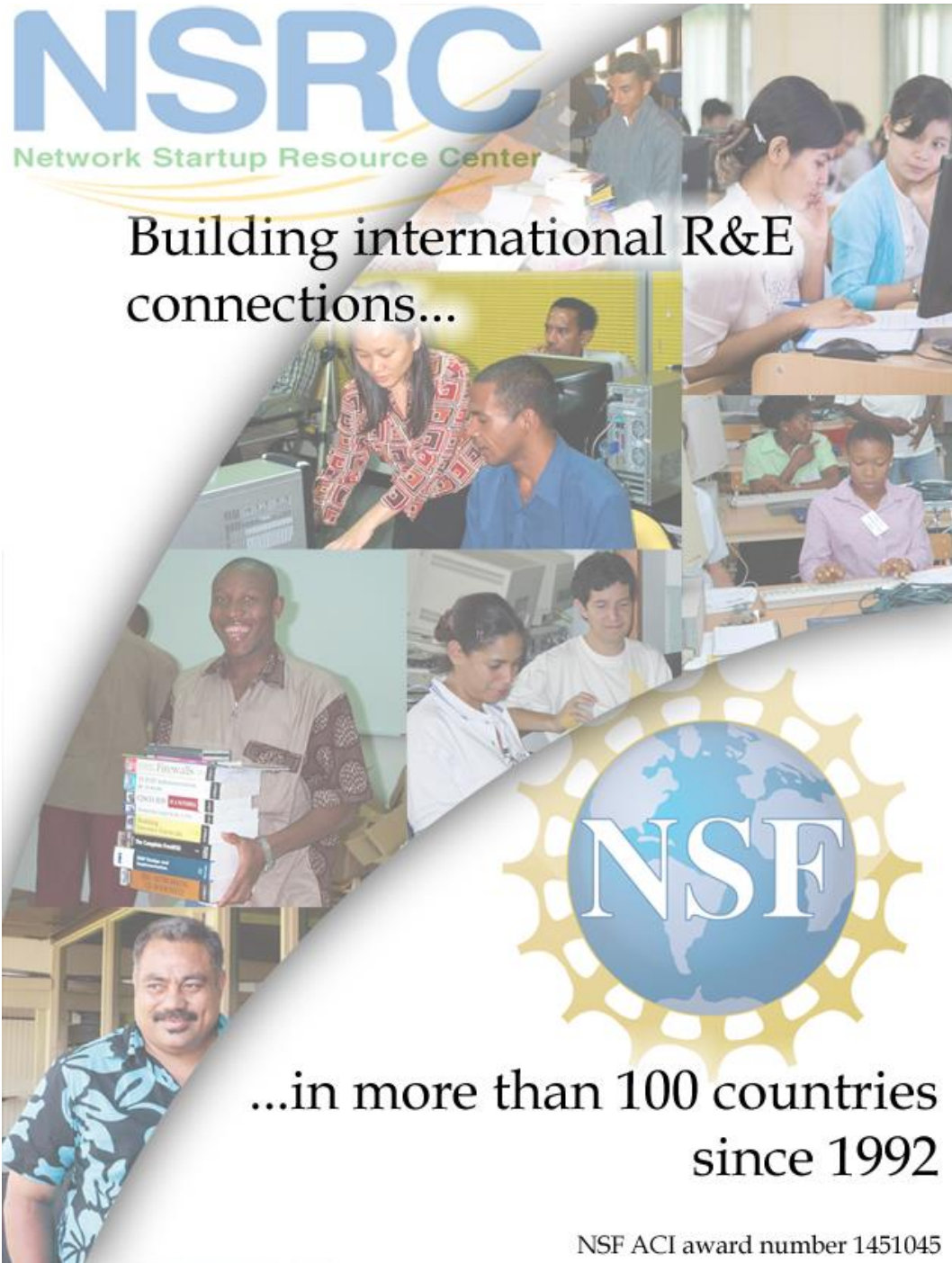


April 2018, NSRC Campus Network Design Tutorial, Guam

NSRC

Network Startup Resource Center

Building international R&E
connections...



...in more than 100 countries
since 1992

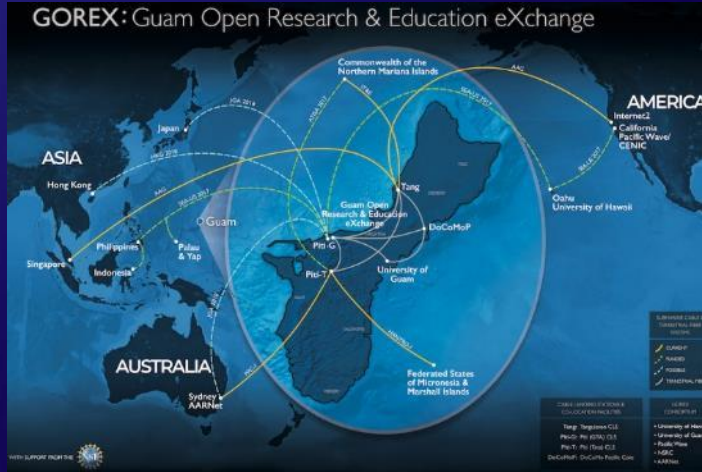
NSF ACI award number 1451045



Hội thảo quốc tế Sáng kiến Hạ lưu sông Mê Kông
HẠ TẦNG CNTT VÀ TÀI NGUYÊN NƯỚC VÙNG HẠ LƯU SÔNG MÊ KÔNG
Lower Mekong Initiative International Workshop
CYBERINFRASTRUCTURE AND WATER RESOURCES IN THE LOWER MEKONG REGION



University of Guam



Continued support in the form of:

- Direct engineering assistance
- Workshops, Equipment, Fellowships
- Instructor capacity building
- Updated campus network

Work in coordination with University of Hawaii and Pacific Wave over several years to help facilitate GOREX and Internet2 connectivity.



←
**Before
NSRC
(July 2016)**

→
**After
NSRC
(April 2018)**





For more information regarding GOREX

- ❑ <http://www.hawaii.edu/piren/>

- ❑ <https://gorex.uog.edu>

- ❑ Email: uognoc@uog.edu

QUESTIONS?

